PME RESEARCH LABORATORY, MAY 1980

PROJECT TITLE : BIOTECHNOLOGY

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1. LACTIC ACID CONSUMPTION (1)

It has been shown in the laboratory that the amount of lactic acid used in the denitration process highly depends on the pH of the system (2). The lactic acid is, however, not used up totally by the yeasts. The following amounts were found in the denitrated extracts:

pH of the denitration	lactic acid in denitrated extracts mg/l	% lactic acid metabolised by yeasts
4	9523	78.8
5.5	8837	74.4
6.3	6580	77.8
6.8	8652	62.6
7.0	6433	49.3

The data show that lactic acid is used up by 75 % as long as the pH of the denitration lies between 4 and 6.5, i.e. pH values that are known to be optimal for yeast metabolism and growth. At higher pH values, less lactic acid is used and denitration still functions in spite of the fact that the conditions are suboptimal.

Trials in the pilot plant (500 l fermenter) gave quite different results. The overall consumption of lactic acid was about the same, but only 2000 mg/l lactic acid was found in the denitrated extract. This difference may be due to scaling up or the fact that in the 500 l fermenter a mixture of 90 % lactic acid and 10 % phosphoric acid was used to maintain the pH.

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2. CITRIC ACID CONSUMPTION (3)

When citric acid was used instead of lactic acid for pH control of the denitration process, a similar correlation between the pH of the system and the consumption of citric acid was found. For every liter of extract (standard RL stem blend extracted 1:10 with water) containing 5 g/l NO_3^- and 0.2 % KH_2PO_4, the following amount of citric acid (90 %) was consumed:

pH of the denitration	consumption of citric acid g/l
5.5	33.3
6.5	25.2
7.2	9.4

The residual amounts of citric acid in denitrated extracts have not yet been determined.

3. MISCELLANEOUS

- Assistance has been given to the pilot plant for the ongoing trials.
- Media for tissue cultures have been prepared.

REFERENCES

(1) J. Berney, Notebook 128, 46-50

(2) D. Schulthess, Monthly Report Biotechnology, April 1980

(3) M. F. Mangilli, Notebook 791205, 41-44

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